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The image shows a page from a spiral notebook with handwritten physics calculations. At the top, a force vector $F_1 = 200\text{ N}$ is shown at a 60° angle to the horizontal. Its components are calculated as $F_x = F_1 \cos 60^\circ = 200 \cdot 0.5 = 100\text{ N}$ and $F_y = F_1 \sin 60^\circ = 200 \cdot 0.866 = 173.2\text{ N}$. A second force $F_2 = 300\text{ N}$ is shown acting along the negative x-axis. The resultant force components are $R_x = -100\text{ N} + 300\text{ N} = 200\text{ N}$ and $R_y = 173.2\text{ N}$. The magnitude of the resultant force is $R = \sqrt{200^2 + 173.2^2} = \sqrt{79,998.24} = 282.82\text{ N}$. The angle θ is found using $\tan \theta = \frac{173.2}{200}$, resulting in $\theta = 40.8925^\circ$.

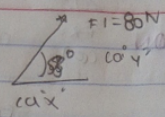
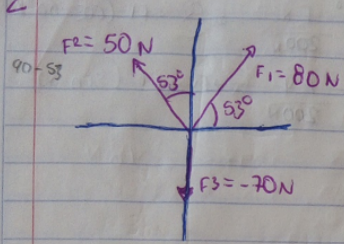
$F_1 = 200\text{ N}$
 60°
 $F_x = F_1 \cos 60^\circ$
 $F_x = 200 \cdot 0.5 = 100\text{ N}$
 $F_y = F_1 \sin 60^\circ$
 $F_y = 200 \cdot 0.866 = 173.2\text{ N}$
 $F_2 = 300\text{ N}$
 $R_x = -100\text{ N} + 300\text{ N} = 200\text{ N}$
 $R_y = 173.2\text{ N}$
 $R = \sqrt{R_x^2 + R_y^2}$
 $R = \sqrt{200^2 + 173.2^2}$
 $R = \sqrt{79,998.24}$
 $R = 282.82\text{ N}$
 $\tan \theta = \frac{R_y}{R_x}$
 $\tan \theta = \frac{173.2}{200}$
 $\theta = 40.8925^\circ$

Resistencia de materiales de construcción

UDS Mi Universidad

24 de septiembre del 2022

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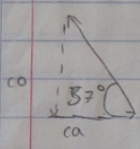


$$\cos 53^\circ = \frac{F_{1x}}{80N} \rightarrow F_{1x} = 80N (\cos 53^\circ)$$

$$\sin 53^\circ = \frac{F_{1y}}{80N} \rightarrow F_{1y} = 80N (\sin 53^\circ)$$

$$F_{1x} = 48.14N$$

$$F_{1y} = 63.89N$$



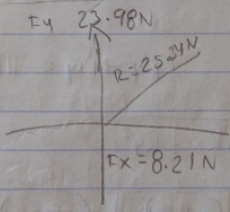
$$\cos 37^\circ = \frac{F_{2x}}{50N} \rightarrow F_{2x} = 50N (\cos 37^\circ) = 39.93N$$

$$\sin 37^\circ = \frac{F_{2y}}{50N} \rightarrow F_{2y} = 50N (\sin 37^\circ) = 30.09N$$

$$F_3 = -70N = F_{3y}$$

$$F_x = 48.14N - 39.93N = 8.21N$$

$$F_y = 63.89N + 30.09N + (-70N) = 23.98N$$



$$R = \sqrt{(8.21N)^2 + (23.98N)^2}$$

$$R = \sqrt{67.40N^2 + 575.04N^2}$$

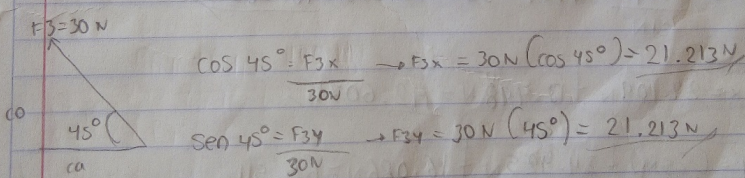
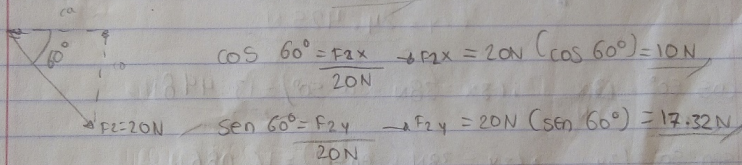
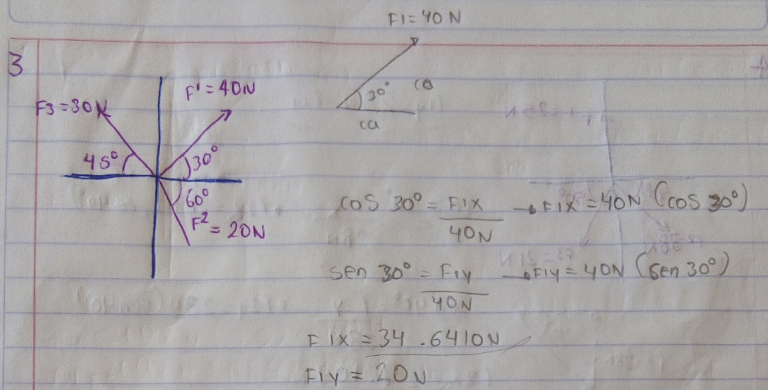
$$R = \sqrt{642.44N^2}$$

$$R = 25.34N$$

$$\tan \theta = \frac{F_y}{F_x}$$

$$\theta = \tan^{-1} \left(\frac{23.98}{8.21} \right)$$

$$\theta = 71.1004^\circ$$



$E_{Fx} = 34.6410 \text{ N} + 10 \text{ N} + 21.213 \text{ N} = 65.854 \text{ N}$

$E_{Fy} = 20 \text{ N} + 17.32 \text{ N} + 21.213 \text{ N} = 58.533 \text{ N}$

$R = \sqrt{(65.854 \text{ N})^2 + (58.533 \text{ N})^2}$

$R = \sqrt{4336.749 \text{ N}^2 + 3426.112 \text{ N}^2}$

$R = \sqrt{7762.861 \text{ N}^2}$

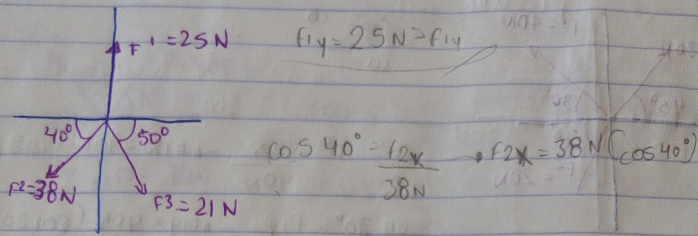
$R = \sqrt{88.107 \text{ N}}$

$\tan \theta = \frac{co}{ca}$

$\theta = \tan^{-1} = \frac{58.533}{65.854}$

$\theta = 41.631^\circ$

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$$F_1 = 25 \text{ N} \quad F_{1y} = 25 \text{ N} = F_{1y}$$

$$\cos 40^\circ = \frac{F_{2x}}{38 \text{ N}} \rightarrow F_{2x} = 38 \text{ N} (\cos 40^\circ)$$

$$\sin 40^\circ = \frac{F_{2y}}{38 \text{ N}} \rightarrow F_{2y} = 38 \text{ N} (\sin 40^\circ)$$

$$F_{2x} = 29.109 \text{ N}$$

$$F_{2y} = 24.425 \text{ N}$$

$$\cos 50^\circ = \frac{F_{3x}}{21 \text{ N}} \rightarrow F_{3x} = 21 \text{ N} (\cos 50^\circ) = 13.498 \text{ N}$$

$$\sin 50^\circ = \frac{F_{3y}}{21 \text{ N}} \rightarrow F_{3y} = 21 \text{ N} (\sin 50^\circ) = 16.086 \text{ N}$$

$$F_x = 29.109 \text{ N} + 13.498 \text{ N} = 42.607 \text{ N}$$

$$F_y = (25 \text{ N}) + 24.425 \text{ N} + 16.086 \text{ N} = 65.511$$

$$R = \sqrt{(42.607 \text{ N})^2 + (65.511 \text{ N})^2}$$

$$R = \sqrt{1,815.356 \text{ N}^2 + 4,291.691 \text{ N}^2}$$

$$R = \sqrt{6,107.047}$$

$$R = 2,471.244 \text{ N}$$

$$\tan \theta = \frac{F_y}{F_x}$$

$$\theta = \tan^{-1} = \frac{65.511}{42.607}$$

$$\theta = 56.960$$